Accredited Standards Committee*
X3, Information Technology

X3 SUBGROUP ANNUAL REPORT

Annual Report for: **X3T10**
Covering the Period: April 1994 to March 1995
Title of X3 Subgroup: Lower Level Interfaces
Informal Description of Work: X3T10 develops standards and technical reports on I/O interfaces, particularly SCSI (Small Computer System Interface) and ATA (AT Attachment), also known as IDE (Integrated Drive Electronics).

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I.   Executive Summary

After completing its first full year of operation, X3T10 is running smoothly with 30 projects. Most of the active projects are related to the SCSI-3 family of standards. There are also several active projects on AT Attachment (ATA), which is often called Integrated Drive Electronics (IDE). X3T10 membership has declined slightly to 58 members from last year's 60 members. This change can probably be accounted to a couple members who gained instant membership last year at X3T10's organizational meeting, then didn't participate further.

Work continues to progress in mapping SCSI command sets to three serial interfaces: Fibre Channel, SSA, and P1394. Additionally, a Packet Interface for ATA, called ATAPI is mapping SCSI commands to the ATA physical interface.

The X3T10.1 task group has struggled with leadership issues (lack of a Vice-Chair and lack of timely minutes), but is now taking steps to recover (there is a volunteer for Vice-Chair and the current Chair plans to step down so an experienced officer with time available can take over as Chair).

II.   Projects

1.   Interfaces Between Flexible Disks and Their Host Controllers

a.   Project 0052-M, Interfaces Between Flexible Disks and Their Host Controllers

b.   Target date for dpANS to X3:   ?
          Original target date:
          Previous target date:
          Current target date: Published

c.   Project Description: This is a maintenance project on ANSI/ISO/IEC 9315:[1994], which was previously identified as X3.80-1988, Interfaces Between Flexible Disks and Their Host Controllers.

d.   Publications during the past year: none.

e.   Statement of Progress or Accomplishments During Year: X3 recommended and ANSI adopted the international version of this standard.

    f.   Statement of Status as of This Report: Maintenance Phase -- no activity.

    g.   Future Plans: none.

    h.   Reasons for Delay: none.

2.   Storage Module Interfaces (SMD-E)

    a.   Project 0053-RF Storage Module Interfaces (SMD-E)

    b.   Target date for dpANS to X3:   ?
          Original target date:
          Previous target date:
          Current target date: Published--Reaffirmed: October 12, 1992

    c.   Project Description: This is a maintenance project on X3.91-1992, Storage Module Interfaces.

    d.   Publications during the past year: none.

    e.   Statement of Progress or Accomplishments During Year: none.

    f.   Statement of Status as of This Report: Maintenance Phase -- 5yr review due in 1996.

    g.   Future Plans: none.

    h.   Reasons for Delay: none.

3.   Small Computer System Interface (SCSI-2)

    a.   Project 0375-R, Small Computer System Interface (SCSI-2)

    b.   Target date for dpANS to X3:
          Original target date: January 1988
          Previous target date: December 1991
          Current target date: none -- BSR approved 1/31/94

    c.   Project Description: This project is a revision of X3.131-1990 (SCSI-2 Rev 10c), which was approved by ANSI 8/31/90, but never published at X3's request.

    d.   Publications During Past Year: ANS X3.131-1994 published and two TIBs prepared for publication.

    e.   Statement of Progress or Accomplishments During Year: SCSI-2 was FINALLY published!

    f.   Statement of Status as of This Report: Maintenance Phase -- 5yr review due in 1998; two TIBs are being processed and are at X3 for approval.

    g.   Future Plans: none for SCSI-2; work continues on the SCSI-3 family of standards.

    h.   Reasons for Delay: The project was delayed because of misunderstandings between X3 and ANSI regarding the degree of changes that can be accommodated during the publication phase.

4.   Device Level Interface for Streaming Cartridge and Cassette Tape Drives

    a.   Project 0378-M, Device Level Interface for Streaming Cartridge and Cassette Tape Drives

    b.   Target date for dpANS to X3:
          Original target date: ?
          Previous target date: ?
          Current target date: Published

    c.   Project Description: This is a maintenance project on X3.146-1986 [R1992].

    d.   Publications During Past Year: none.

    e.   Statement of Progress or Accomplishments During Year: none.

    f.   Statement of Status as of This Report: Maintenance Phase -- 5yr review due in 1996.

    g.   Future Plans: none.

    h.   Reasons for Delay: none.

5.   Enhanced Small Device Interface (ESDI)

    a.   Project 0587-M, Enhanced Small Device Interface (ESDI)

    b.   Target date for dpANS to X3:
          Original target date: ?
          Previous target date:
          Current target date: Maintenance Phase -- 5yr review due in 1998.

    c.   Project Description: This is a maintenance project on X3.170-1990[1994]/X3.170a-1991[1994].

    d.   Publications During Past Year: none.

    e.   Statement of Progress or Accomplishments During Year: Reaffirmed on 11/14/94.

    f.   Statement of Status as of This Report: Maintenance Phase -- 5yr review due in 1998.

    g.   Future Plans: none.

    h.   Reasons for Delay: none.

6.   AT Attachment Interface for Disk Drives (ATA)

    a.   Project 0791-M, AT Attachment Interface for Disk Drives (ATA)

    b.   Target date for dpANS to X3:
          Original target date: August 1991
          Previous target date: July 1993
          Current target date: Maintenance Phase -- 5yr review due in 1998.

    c.   Project Description: The widespread use of desktop computers with a 16-bit memory bus has led to the adoption within the industry of a disk drive which attaches via a subset of the personal computer AT bus. Because of their compatibility with existing personal computer AT hardware and software this interface quickly became a de facto industry standard. The intent of this project is to develop a standard to specify a subset of the AT bus specifically for the direct attachment of peripherals. This standard will specify the mechanical and electrical characteristics as well as the methods by which commands are directed to peripherals, the contents of registers, and the method of data transfers.

d.   Publications During Past Year: ANS X3.221-1994.

e.   Statement of Progress or Accomplishments During Year: Published.

f.   Statement of Status as of This Report: Maintenance Phase -- 5yr review due in 1998.

g.   Future Plans: None for ATA-1; ATA-2 is in approval phase and ATA-3 is in development phase.

h.   Reasons for Delay: Public review comments.

7.   SCSI Common Access Method (SCSI CAM)

a.   Project 0792-M, SCSI Common Access Method (SCSI CAM)

b.   Target date for dpANS to X3:
       Original target date: August 1991
       Previous target date: September 1994
       Current target date: February 1995

c.   Project Description: This project defines a common method to access SCSI devices through a standard software interface to SCSI host adapters for several popular operating systems. This should result in simplified integration of products.

d.   Publications During Past Year: none.

e.   Statement of Progress or Accomplishments During Year: All comments from 1PR have been resolved, three revisions of the working draft were distributed, and the document has been re-forwarded for second public review.

f.   Statement of Status as of This Report: This dpANS has been forwarded to second public review which closes April 4, 1995. No comments have been received to date.

g.   Future Plans: A CAM-2 project (0990-D) has been authorized.

h.   Reasons for Delay: Public review comments.

8.   SCSI Technical Information Bulletins

a.   Project 0817-D, SCSI Technical Information Bulletins

b.   Target date for dpANS to X3:
       Original target date: August 1991
       Previous target date: February 1995
       Current target date: February 1995

c.   Project Description: This project was been administratively withdrawn by Lynn Barra on 2/27/95. In the future, please refer to project 0375-M for TIB information.

d.   Publications During Past Year: Two TIBs forwarded to X3 for publication by Global Engineering.

e.   Statement of Progress or Accomplishments During Year: Two TIBs forwarded to X3.

f.   Statement of Status as of This Report: Project closed.

g.   Future Plans: Process any future TIBs under Project 0375-M.

h.   Reasons for Delay: Waiting for SCSI-2 to be published.

9.   SCSI-3 Parallel Interface (SPI)

a.   Project 0855-D, SCSI-3 Parallel Interface (SPI)

b.   Target date for dpANS to X3:
        Original target date: April 1992
        Previous target date: July 1994
        Current target date: February 1995

c.   Project Description: The SCSI-3 Parallel Interface standard will maintain a high degree of
        compatibility with SCSI-2 while providing documentation for new capabilities including an option to
        permit 16-bit data transfers on a single cable and expanded bus connectivity options to increase the
        maximum number of SCSI devices on a cable from 8 to 16 or more. This standard is not intended
        to address areas above the physical level (such as protocol and command sets). It is intended that
        this proposed standard could be used in conjunction with the command sets defined in SCSI-2
        and/or subsequent versions of SCSI.

d.   Publications During Past Year: none.

e.   Statement of Progress or Accomplishments During Year: The SCAM protocol was incorporated an
        a normative annex (as a result of an X3T10 comment during first public review). Three working
        drafts were distributed and SPI Revision 15 has been forwarded to X3 for second public review.

f.   Statement of Status as of This Report: Second Public Review closes April 4, 1995. No
        comments received to date.

g.   Future Plans: There has been recent discussion of creating a one or two SPI-2 projects and
        possibly several related technical reports.

h.   Reasons for Delay: Incorporated the SCAM protocol into SPI as a result of an X3T10 public
        review comment.

10.   SCSI-3 Interlocked Protocol (SIP)

a.   Project 0856-D, SCSI-3 Interlocked Protocol (SIP)

b.   Target date for dpANS to X3:
        Original target date: April 1992
        Previous target date: November 1994
        Current target date: July 1995

c.   Project Description: The SCSI-3 Interlocked Protocol standard maintains a high degree of
        compatibility with the equivalent functions in SCSI-2 while defining several new features and
        functions. The candidate new features are support of more than 8 devices, dual porting, and other
        evolutionary features. This standard is intended to be used in conjunction with the SCSI-3 Parallel
        Interface standard and the SCSI-3 command set standards.

d.   Publications During Past Year: none.

e.   Statement of Progress or Accomplishments During Year: We went through most of the past year
        with a Project Editor who was too overloaded to work on SIP. He turned the project over to a
        person who has found time to prepare a recent revision of this document. The Editorship turned
        over again in March '95 to a person who is very motivated to finish SIP. Now that both SAM and SPI
        are nearing completion, there should be no further obstacles to completing this project.

f.   Statement of Status as of This Report: Revision 4a distributed in January.

g.   Future Plans: none.

h.   Reasons for Delay: Previous project editors were overloaded and delays in SPI and SAM prevented progress on SIP.

11.   ATA Extensions (ATA-2)

a.   Project 0948-D, ATA Extensions (ATA-2)

b.   Target date for dpANS to X3:
        Original target date: December 1992
        Previous target date: September 1994
        Current target date: May 1995

c.   Project Description: This project is intended to develop extensions to the draft AT Attachment standard without requiring changes to presently installed devices or existing software. Candidates for features in this standard include items that were identified late in the development of the AT Attachment draft standard and other evolutionary features.

d.   Publications During Past Year: none.

e.   Statement of Progress or Accomplishments During Year: There has been a significant number of ad hoc meetings devoted to completing the ATA-2 working draft and 5 working drafts were distributed. A letter ballot to forward ATA-2 to X3 closed March 2, 1995 and passed 47-1-0-9. Most comments were resolved, but the document is being forwarded with one outstanding negative.

f.   Statement of Status as of This Report: ATA-2 Rev 3 has been forwarded to X3 for 1PR.

g.   Future Plans: An ATA-3 project (2008-D) has been approved.

h.   Reasons for Delay: Extensive eleventh-hour revisions.

12.   Directly-Addressable Device Interface (DADI)

a.   Project 0964-D, Directly-Addressable Device Interface (DADI)

b.   Target date for dpANS to X3:
        Original target date: December 1993
        Previous target date: TBD
        Current target date: Not applicable.

c.   Project Description: This project was intended to develop a device interface to provide an alternative means of attaching storage devices which is better suited to direct board mounting than the traditional channel model. There was no X3T9.2 or X3T10 activity on this project, so, in January 1995, X3T10 voted to recommend that the project be withdrawn.

d.   Publications During Past Year: none.

e.   Statement of Progress or Accomplishments During Year: None. X3T10 has recommended that this project be withdrawn.

f.   Statement of Status as of This Report: An X3 letter ballot has been issued to withdraw this project.

g.   Future Plans: Wait until this concept is ready for primetime.

h.   Reasons for Delay: Premature technology.

13.   Serial Storage Architecture - Physical Layer (SSA-PH)

a.   Project 0989-D, Serial Storage Architecture - Physical Layer (SSA-PH)

b.   Target date for dpANS to X3:
        Original target date: June 1994
        Previous target date: March 1995
        Current target date: December 1995

c.   Project Description: The SSA-PH interface proposal is a cable interface for storage products that is capable of transporting a variety of protocols. SSA-PH offers the following features: high data rate (raw 20 MB/sec signaling rate), full duplex transmission, no arbitration required, architecture independent of data rate, fast recovery time from errors and cabling changes, high data integrity, low raw error rate, architected error recovery, hot pluggable units, failure tolerance via redundant paths to devices, economical implementation (CMOS), economical use of bandwidth, small frame size (for buffer expense reduction), self-configuration capabilities, 10 meter distance per cable segment, high connectivity, small signal count, low voltage (3.3 V), extensibility (higher speeds and optical capable) and the elimination of jumpers (and extra cables) for address and spindle sync.

d.   Publications During Past Year: none.

e.   Statement of Progress or Accomplishments During Year: The Task Group has spent considerable time documenting the physical interface (electrical levels and timing).

f.   Statement of Status as of This Report: In development. Only one revision was circulated in 1994 due to editorial problems, but three drafts have been prepared in 1995. There are still extensive editorial issues, but the technical issues have become more stable.

g.   Future Plans: There is a need to document a version of SSA with double the signaling rate (40 MByte/Sec vs. 20 MByte/Sec). X3T10.1 is contemplating restructuring several of the SSA projects.

h.   Reasons for Delay: Unrealistic schedule projections.

14.   Common Access Method - 3 (CAM-3)

a.   Project 0990-D, Common Access Method - 3 (CAM-3)

b.   Target date for dpANS to X3:
        Original target date: July 1994
        Previous target date: January 1995
        Current target date: July 1996

c.   Project Description: This project is intended to revise and enhance the SCSI Common Access Method (CAM) such as adding 64-bit addressing and additional queuing modes.

d.   Publications During Past Year: none.

e.   Statement of Progress or Accomplishments During Year: Those interested in CAM have recently begun working on this project. They have requested that the project be renamed CAM-3 to align with the SCSI-3 name. This project was previously called CAM-2, which created confusion as CAM was designed to work with SCSI-2.

f.   Statement of Status as of This Report: Early development phase.

g.   Future Plans: none.

h.   Reasons for Delay: The CAM project completely adsorbed the resources of those interested in this project.

15.   SCSI-3 Generic Packetized Protocol (GPP)

a.   Project 0991-DT, SCSI-3 Generic Packetized Protocol (GPP)

b.   Target date for dpANTR to X3:
         Original target date: June 1993
         Previous target date: ?
         Current target date: March 1995

c.   Project Description: The Generic Packetized Protocol is intended to provide a protocol that can take advantage of multiple physical interfaces in a length-independent manner (i.e., a minimum number of packets per I/O Process). The Generic Packetized Protocol encapsulates the SCSI protocol, functions, commands, status, and data requiring minimal services from the physical interface. **This project was converted from a Standards project to a Technical Report project during the last year.**

d.   Publications During Past Year: none.

e.   Statement of Progress or Accomplishments During Year: This project ran into considerable controversy in late 1993 and through most of 1994 as various X3T10 members objected to GPP being positioned as an alternative (and competing) protocol for all of the SCSI-3 protocols. Many people felt that GPP should instead be positioned as a protocol to be used when no other SCSI-3 protocol had been defined for the specific interface and specifically for specialized applications that require long distances or high-latency interfaces.   As a result, X3T10 voted to change this project into a Technical Report. Two working drafts were prepared and distributed.

f.   Statement of Status as of This Report: X3T10 has voted to forward the GPP Technical Report, Revision 9 (contains minor changes resolving one X3T10 LB Yes comment), to X3 for first public review. The GPP project editor had some technical difficulties in preparing Revision 9 for forwarding. It is now finished and will be forwarded to X3.

g.   Future Plans: none.

h.   Reasons for Delay: Mostly due to the controversy over the GPP scope.

16.   SCSI-3 Serial Bus Protocol (SBP)

a.   Project 0992-D, SCSI-3 Serial Bus Protocol (SBP)

b.   Target date for dpANS to X3:
         Original target date: February 1994
         Previous target date: May 1994
         Current target date: December 1994

c.   Project Description: The Serial Bus Protocol is intended to provide a protocol that can take advantage of the capabilities provided by the High Performance Serial Bus (IEEE 1394) to support an efficient transport service for SCSI products.

d.   Publications During Past Year: none.

e.   Statement of Progress or Accomplishments During Year: This project ran very smoothly with a flurry of 4 working drafts to wrap up the final technical details.

f.   Statement of Status as of This Report: First public review closed March 21, 1995. At least one public review comment was received and will need to be addressed.

g.   Future Plans: none.

h.   Reasons for Delay: The IEEE P1394 project was delayed.

17.   SCSI-3 Fibre Channel Protocol (FCP)

a.   Project 0993-D, SCSI-3 Fibre Channel Protocol (FCP)

b.   Target date for dpANS to X3:
          Original target date: February 1994
          Previous target date: May 1994
          Current target date: December 1994

c.   Project Description: The SCSI-3 Fibre Channel Protocol is intended to provide a protocol that can take advantage of the capabilities provided by the Fibre Channel physical layer to support an efficient, low-overhead transport service for SCSI products.   The FCP is one of the protocols used in the FC-4 layer of Fibre Channel.

d.   Publications During Past Year: none.

e.   Statement of Progress or Accomplishments During Year: After preparing 3 working drafts, X3T10 forwarded FCP to X3 at its November 1994 meeting.

f.   Statement of Status as of This Report: First public review closed March 21, 1995. Several comments were received and are being addressed.

g.   Future Plans: none.

h.   Reasons for Delay: This project was dependent on SAM and FC-PH reaching stability.

18.   SCSI-3 Architecture Model (SAM)

a.   Project 0994-D, SCSI-3 Architecture Model (SAM)

b.   Target date for dpANS to X3:
          Original target date: February 1994
          Previous target date: May 1994
          Current target date: December 1994

c.   Project Description: The SCSI-3 Architecture Model defines the architecture of SCSI and provides a model for implementing several protocols on a variety of transport mechanisms. This standard will define a unifying framework for the implementation of SCSI.

d.   Publications During Past Year: none.

e.   Statement of Progress or Accomplishments During Year: In spite of considerable controversy early in 1994, consensus was reached on SAM. Three working drafts were distributed. X3T10 forwarded SAM to X3 at its November 1994 meeting.

f.   Statement of Status as of This Report: First public review closed March 21, 1995. Several public review comments were received and are being addressed.

g.   Future Plans: none.

h.   Reasons for Delay: Controversy on several SAM requirements lead to a longer than anticipated time to reach consensus on the working draft.

19. SCSI-3 Primary Commands (SPC)

a.   Project 0995-D, SCSI-3 Primary Commands (SPC)

b.   Target date for dpANS to X3:
         Original target date: June 1994
         Previous target date: November 1994
         Current target date: September 1995

c.   Project Description: The SPC is intended to provide a definition of those commands absolutely necessary to function in an SCSI environment plus those commands that are defined consistently for more than one command set. This command set will provide the means to identify the device type and hence identify which command set is appropriate for the device.

d.   Publications During Past Year: none.

e.   Statement of Progress or Accomplishments During Year: Considerable progress was made on SPC with five working drafts prepared; in fact, the project editor believes the current draft is complete. However, since SPC has impacts on all the other SCSI-3 Command Set projects (SBC, SCC, SGC, SMC, SCC, and MMC), there has been some reluctance to forward the working draft until the other projects are further along.

f.   Statement of Status as of This Report: We anticipate a forwarding letter ballot to follow the May '95 X3T10 meeting.

g.   Future Plans: none.

h.   Reasons for Delay: Waiting on the other SCSI-3 command set documents to reach maturity.

20. SCSI-3 Block Commands (SBC)

a.   Project 0996-D, SCSI-3 Block Commands (SBC)

b.   Target date for dpANS to X3:
         Original target date: June 1994
         Previous target date: November 1994
         Current target date: September 1995

c.   Project Description: The SCSI-3 Block Commands is intended to provide a complete set of commands to complement the SCSI-3 Primary Commands, and will be applicable to devices which transfer data in fixed block sizes (e.g., disk drives).

d.   Publications During Past Year: none.

e.   Statement of Progress or Accomplishments During Year: This project finally has a volunteer to be project editor and he produced the first revision in November 1994. Although SBC got a late start, the Block Commands have not changed significantly since SCSI-2 so the project could complete rapidly.

f.   Statement of Status as of This Report: The second working draft has been completed incorporating all accepted proposals.

g.   Future Plans: none.

h.   Reasons for Delay: Lack of a project editor.

21.   **SCSI-3 Stream Commands (SSC)**

a.   Project 0997-D, SCSI-3 Stream Commands (SSC)

b.   Target date for dpANS to X3:
      Original target date: June 1994
      Previous target date: November 1994
      Current target date: September 1995

c.   Project Description: The SCSI-3 Stream Commands is intended to provide a complete set of commands to complement the SCSI-3 Primary Commands, and be applicable to devices which transfer data in a streaming manner (e.g., tape drives).

d.   Publications During Past Year: none.

e.   Statement of Progress or Accomplishments During Year: This project has been running smoothly and the working draft is nearly complete. Three working drafts were prepared

f.   Statement of Status as of This Report: This project is also nearly ready to forward.

g.   Future Plans: none.

h.   Reasons for Delay: Waiting on the other SCSI-3 command set documents to reach maturity.

22.   **SCSI-3 Graphic Commands (SGC)**

a.   Project 0998-D, SCSI-3 Graphic Commands (SGC)

b.   Target date for dpANS to X3:
      Original target date: June 1994
      Previous target date: November 1994
      Current target date: April 1996

c.   Project Description: The SCSI-3 Graphic Commands is intended to provide a complete set of commands to complement the SCSI-3 Primary Commands, and be applicable to devices which transfer data from/to a visual representation to/from a computer.

d.   Publications During Past Year: none.

e.   Statement of Progress or Accomplishments During Year: Recently, we received a volunteer to act as project editor on the SGC project.

f.   Statement of Status as of This Report: Since the SGC project editor is also acting as the SBC project editor, SGC may be delayed further.

g.   Future Plans: none.

h.   Reasons for Delay: Lack of a project editor.

23.   **SCSI-3 Medium Changer Commands (SMC)**

a.   Project 0999-D, SCSI-3 Medium Changer Commands (SMC)

b.   Target date for dpANS to X3:
      Original target date: June 1994

            Previous target date: November 1994
            Current target date: November 1995

c.   Project Description: The SCSI-3 Medium Changer Commands is intended to provide a complete set of commands to complement the SCSI-3 Primary Commands, and be applicable to devices which can relocate data from an inventory location to and from a device.

d.   Publications During Past Year: none.

e.   Statement of Progress or Accomplishments During Year: The SMC project editor produced the first working draft in October 1994 and has recently finished two more revisions.

f.   Statement of Status as of This Report: Revision 4 should be completed soon.

g.   Future Plans: none.

h.   Reasons for Delay: Waiting on the other SCSI-3 command set documents to reach maturity.

24.   SCSI-3 Controller Commands (SCC)

a.   Project 1047-D, SCSI-3 Controller Commands (SCC)

b.   Target date for dpANS to X3:
           Original target date: July 1995
           Previous target date: none.
           Current target date: February 1995

c.   Project Description: The SCSI-3 Controller Commands standard is intended to provide a complete set of commands to complement the SCSI-3 Primary Command Set, and be applicable to devices which act as subsystem controllers, such as a disk array controllers.

d.   Publications During Past Year: none.

e.   Statement of Progress or Accomplishments During Year: This project went from approval to forwarding in less than one year (ahead of schedule!) Four working drafts were prepared and distributed.

f.   Statement of Status as of This Report: SCC is at first public review which closes May 17, 1995.

g.   Future Plans: none.

h.   Reasons for Delay: No delay!

25.   SCSI-3 Multimedia Commands (MMC)

a.   Project 1048-D, SCSI-3 Multimedia Commands (MMC)

b.   Target date for dpANS to X3:
           Original target date: December 1994
           Previous target date: none.
           Current target date: September 1995

c.   Project Description: The SCSI-3 Multimedia Commands standard is intended to provide, in conjunction with the SCSI-3 Primary Commands (SPC), a complete set of commands for CD devices, while maintaining a high degree of compatibility with SCSI-2 compliant CD-ROM devices.

d.   Publications During Past Year: none.

e.   Statement of Progress or Accomplishments During Year: This project has received a great deal of industry interest. Two working drafts were prepared and distributed. It affects both SCSI-3 and ATAPI.

f.   Statement of Status as of This Report: MMC is in active development phase.

g.   Future Plans: none.

h.   Reasons for Delay: The first project editor had to resign due to changes in his work assignment and there have been several recent developments in the CD-ROM industry that are extending the time to complete this project.

26.   Serial Storage Protocol (SSP)

a.   Project 1051-D, Serial Storage Protocol (SSP)

b.   Target date for dpANS to X3:
             Original target date: December 1994
             Previous target date: none.
             Current target date: February 1996

c.   Project Description: The Serial Storage Protocol (SSP) will define a protocol for mapping the SCSI-3 Command Sets to the Serial Storage Architecture -- Transport Layer (SSA-PH).

d.   Publications During Past Year: none.

e.   Statement of Progress or Accomplishments During Year: This project has been placed on the back burner while the SSA-SCSI2 mapping Technical Report is developed. Most SSA developers believe the SCSI-2 mapping is more critical to the success of SSA at this time. It is expected that SSP will be able to leverage much from the SSA-SCSI2 Technical Report. One working draft was distributed -- some effort is needed to convert the draft SSP from IBM Bookmaster to Word.

f.   Statement of Status as of This Report: On hold. Development work is expected to resume 3Q95.

g.   Future Plans: none.

h.   Reasons for Delay: Priority is being placed on the SSA-SCSI2 Technical Report.

27.   SCSI-3 Fast-20 Parallel Interface (Fast-20)

a.   Project 1071-D, SCSI-3 Fast-20 Parallel Interface (Fast-20)

b.   Target date for dpANS to X3:
             Original target date: November 1995
             Previous target date: none.
             Current target date: May 1995

c.   Project Description: The Fast-20 standard is intended to document extensions to SPI to permit transfer rates of 20 mega-transfers per second, while maintaining a high degree of compatibility with SPI.

d.   Publications During Past Year: none.

e.   Statement of Progress or Accomplishments During Year: This project has moved at great speed due to the narrow scope and a strong industry demand for a transfer rate enhancement in SCSI. Four working drafts have been distributed.

f.   Statement of Status as of This Report: The X3T10 letter ballot for forwarding passed in January and X3T10 addressed comments and one late-arriving issue in March. Fast-20 Rev 6 was forwarded to X3 in March.

g.   Future Plans: none.

h.   Reasons for Delay: No delay!

28. AT Attachment - 3 Interface (ATA-3)

a.   Project 2008-D, AT Attachment - 3 Interface (ATA-3)

b.   Target date for dpANS to X3:
        Original target date: December 1995
        Previous target date: none.
        Current target date: December 1995

c.   Project Description: The proposed ATA-3 standard maintains a high degree of compatibility with the ATA-2 interface and migrates the interface to meet tomorrow's needs in an evolutionary way. ATA-3 is primarily intended to be a low-cost, efficient disk drive interface.

d.   Publications During Past Year: none.

e.   Statement of Progress or Accomplishments During Year: A project editor has volunteered and has prepared the first working draft.

f.   Statement of Status as of This Report: In development.

g.   Future Plans: none.

h.   Reasons for Delay: none.

29. ATA Packet Interface (ATAPI)

a.   Project 1120-D, ATA Packet Interface (ATAPI)

b.   Target date for dpANS to X3:
        Original target date: December 1995
        Previous target date: none.
        Current target date: December 1995

c.   Project Description: The proposed ATAPI standard maintains a high degree of compatibility with the current ATA interface while providing enhancements to extend its usability to other device types. The ATAPI standard aims to: a) provide a means to support any device that implements SCSI commands through the definition of a packet protocol; b) investigate enhancements to provide overlapped commands using a multi-thread protocol; c) allow a shared cable connection with ATA disk drives. This proposed standard will not define the command sets used over ATAPI; those are separate projects.

d.   Publications During Past Year: none.

e.   Statement of Progress or Accomplishments During Year: A project editor has volunteered and is currently preparing the first working draft.

f.   Statement of Status as of This Report: In development.

g.   Future Plans: none.

h.   Reasons for Delay: none.

30.   Serial Storage Architecture SCSI-2 Protocol (SSA-SCSI2)

a.   Project 1121-DT, Serial Storage Architecture SCSI-2 Protocol (SSA-SCSI2)

b.   Target date for dpANTR to X3:
        Original target date: June 1996
        Previous target date: none.
        Current target date: June 1996

c.   Project Description: The proposed SSA-SCSI2 technical report will maintain compatibility with SSA-PH and the commands defined in X3.131-1994. The goals of SSA-SCSI2 are: a) provide the basis of utilization of SCSI-2 Commands on SSA-PH; b) improve compatibility through documentation of implementation requirements and options; c) minimize the impact in converting firmware between SCSI-2 and SSA-SCSI2; d) maximize compatibility with SSA-SSP where possible.

d.   Publications During Past Year: none.

e.   Statement of Progress or Accomplishments During Year: A project editor has volunteered and is currently preparing the first working draft.

f.   Statement of Status as of This Report: In development.

g.   Future Plans: none.

h.   Reasons for Delay: none.

III.   Committee Activities

a.   Previous Year's Meetings (X3T10 date is shown; X3T10.1 met two days earlier):

        May 19, 1994; Harrisburg, PA
        July 21, 1994; Manchester, NH
        September 15, 1994; Houston, TX
        November 10, 1994; Palm Springs, CA
        January 12, 1995; Lake Tahoe, CA
        March 9, 1995; Newport Beach, CA

b.   Current Year's Planned Meetings X3T10:

        May 11, 1995; Harrisburg, PA
        July 13, 1995; Colorado Springs, CO
        September 14; Manchester, NH
        November 9, 1995; Palm Springs, CA
        January 11, 1996; Dallax, TX (tenative)

        Current Year's Planned Meetings X3T10.1:

        May 9, 1995; Harrisburg, PA
        June 29, 1995; San Jose, CA
        August 30, 1995; Southern California
        November 1, 1995; TBD
        February 28, 1996; TBD

c.   Officers: X3T10   X3T10.1
       Chair: John B. Lohmeyer   John Scheible (Ken Hallam is acting Chair)
       Vicechair: Lawrence J. Lamers   Greg Kapraun (acting)
       Secretary: Ralph O. Weber   Lawrence J. Lamers

d.   Membership: The current X3T10 and X3T10.1 membership lists are attached.

e.   Liaison Activities: X3T11, ISO/IEC JTC1/SC25/WG4, IT8, IEEE P1394, IEEE P1285.

f.   Administrative Matters of Note:

THANK YOU for the improved SD-2! It should greatly improve timeliness of X3 standards.

g.   Procedural Matters of Note:

X3T10 has approved a Procedures and Policies document, which is being forwarded to X3 for approval. The intent of the document is to promote more timely development of X3T10 standards.

h.   Recommendations: none.

IV.   Anticipated Projects

It is anticipated that one or more projects will be needed for next-generation SCSI-3 Parallel Interface (possibly called SPI-2). X3T10 has constructed a 'shopping list' of candidate ideas for this (these) project(s). Other next-generation projects may also be required as the current X3T10 projects near completion. X3T10.1 plans projects for enhanced SSA Physical and mapping of ATM over SSA.

V.   Future Trends in this Technical Area

The lower-level I/O interface market is in a state of transition. This is largely the result of technological advances that permit physically smaller disk drives. These drives will trend toward I/O interfaces that directly attach to host system circuit cards without an interface cable. This has resulted in less emphasis on cabled connectors and more emphasis on connectors that can either plug directly into a backplane or into a device connector such as the PCMCIA.

Meanwhile, other I/O interface applications that typically reside outside the processor cabinet, such as magnetic tape, printers, and optical devices, are trending toward serial interfaces to reduce cabling costs. A key enabling technology for these applications is the higher clock rates now available in CMOS and other circuit technologies.

Attachment 1: Committee Projects: SD-4 Data

(To be attached by the X3 Secretariat)

Attachment 2: Internal Procedures

Procedure for Funding X3T10 Technical Editors

Abstract: The volume of work in X3T10 exceeds the capacity and capabilities of volunteer technical editors. This procedure provides funding for paid editors to support the development and publication efforts within X3T10. The necessary funds (Editors Fund) is collected by adding a nominal surcharge to the mailing subscription fee. Funds are distributed to the paid editors by the X3 Secretariat upon approval of an invoice by X3T10.

Enactment: This procedure shall be enacted upon approval by X3T9.2 and X3T9 (which they did in late 1992; X3T10 voted to carry the procedure over to X3T10). Upon enactment, the X3 Secretariat shall establish accounting procedures to collect and administer the Editor Fund.

Funds Collection: The Editors Fund shall be maintained by the X3 Secretariat. A surcharge of $50.00 shall be added to the X3T10 Mailing Subscription Fee. The funds collected from this surcharge shall be accumulated in the Editors Fund. Moneys remaining in the Editors Fund at the end of the year shall be rolled over into the Editors Fund for the next year. X3T10 may adjust the amount of the surcharge to the Mailing Subscription Fee from year to year to reflect anticipated editing workload.

Funds Accounting: The X3 Secretariat shall report that status of the Editors Fund to X3T10 annually and whenever the X3 Secretariat receives an invoice for editing work.

Funds Distribution: Upon receipt of a written invoice for editing work, the X3 Secretariat shall notify the X3T10 Chair providing a copy of the invoice and the current balance in the Editors Fund. The X3T10 Chair shall either add an item to the agenda of the next X3T10 meeting or issue a letter ballot to authorize payment of the invoice. Upon X3T10 approval of the invoice, the X3T10 Chair shall notify the X3 Secretariat of the approval and the X3 Secretariat shall issue a check for payment of the invoice. X3T10 shall not authorize payment of an invoice which would exceed the balance in the Editors Fund.

Editing Authorization: X3T10 may contract editing work on approved projects as deemed appropriate by the Technical Committee providing such contract work does not exceed the funds available in the Editor Fund.

NOTE: In March 1995, X3T10 approved a Procedures and Policies document, which is being forwarded to X3 for approval. The intent of the document is to promote more timely development of X3T10 standards.

Attachment 3: X3T10 Current Membership List (Note: This is the attendance database, which may omit some people from the X3 Secretariat's database of those people receiving mailings, particularly those people who have not attended a meeting.)

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